

Attorney Docket No. 249558US2 DIV

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Supplemental Preliminary Amendment filed: April 16, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-8 (Canceled)

9. (original) A semiconductor device comprising:

a semiconductor substrate having a trench on a surface;

a first insulating film identified by a back face contacting with a bottom face and a lower part of a side face of the trench;

a bottom insulator identified by a bottom face and a side face contacting with a surface of said first insulating film;

a second insulating film identified by a back face contacting with an upper part of the side face of the trench and identified by an end face contacting with an end face of said first insulating film; and

a upper insulator identified by a side face contracting with a surface of said second insulating film and identified by a bottom face contacting an upper face of said bottom insulator.

10. (original) A semiconductor device comprising:

a semiconductor substrate having a trench on a surface;

an insulating film identified by a back face contacting with the surface of said semiconductor substrate and having a first opening on the trench;

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a polysilicon film disposed on a surface of said insulating film and having a second opening over the trench;

a silicon oxide film identified by a back face contacting with a bottom face and a side face of the trench and a side face of the second opening of said polysilicon film and identified by an uniform film thickness; and

an insulator identified by a bottom face and a side face contacting with a surface of said silicon oxide film.

11. (original) The semiconductor device of claim 10, wherein an aspect ratio of the trench exceeds three.

12. (original) A semiconductor device comprising:

a semiconductor substrate having a first trench on a surface;

a silicon oxide film identified by a back face contacting with a bottom face and a side face of the first trench;

a bottom insulator identified by a bottom face and a side face contacting with a surface of said silicon oxide film and identified by an upper face having a second trench; and

an upper insulator identified by a bottom face and a side face contacting with the second trench and identified by a height of an upper face being equal to that of an upper face of said bottom insulator.

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13. (Canceled)

14. (new) The semiconductor device of claim 9, wherein the semiconductor device serves as a nonvolatile memory cell, the first insulating film, the bottom insulator, the second insulating film and the upper insulator serve as a shallow trench isolation area.

15. (new) The semiconductor device of claim 10, wherein the semiconductor device serves as a nonvolatile memory cell, the insulating film serves as a tunnel oxide film, the polysilicon film serves as a floating gate.

16. (new) The semiconductor device of claim 12, wherein the semiconductor device serves as a nonvolatile memory cell, the bottom insulator and the upper insulator serve as an isolation area.

17. (new) A semiconductor device comprising:
a semiconductor substrate having a first trench on a surface;
an insulating film disposed on the surface of said semiconductor substrate and having a first opening on the first trench;
a polysilicon film disposed on an upper face of said insulating film and having a second opening over the first trench;
a bottom insulator identified by a height of an upper face being higher than a height of

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the upper face of said insulating film, and contacting with the first trench, the first opening and the second opening; and

an upper insulator contacting with said bottom insulator.

18. (new) The semiconductor device of claim 17, wherein the semiconductor device serves as a nonvolatile memory cell, the insulating film serves as a tunnel oxide film, the polysilicon film serves as a floating gate.

19. (new) The semiconductor device of claim 18, wherein the bottom insulator comprises a first silicon oxide film contacting with the first trench and the insulating film, and a second silicon oxide film contacting with the insulating film and the second opening.

20. (new) The semiconductor device of claim 19, wherein a thickness of the first silicon oxide film is equal to a thickness of the second silicon oxide film.

21. (new) The semiconductor device of claim 17, wherein the upper insulator contacting with the second opening.

22. (new) The semiconductor device of claim 17, wherein the bottom insulator has a second trench in the upper face, and the upper insulator contacts with the second trench.

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23. (new) The semiconductor device of claim 22, wherein the semiconductor device serves as a nonvolatile memory cell, the insulating film serves as a tunnel oxide film, the polysilicon film serves as a floating gate.